

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY

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Multichannel seismic-reflection profiles collected aboard R/V GILLISS,
Cruise GS7903, Leg 7, in Santaren and Nicholas Channels, near Cay Sal,
southwestern Bahamas

by

Mahlon M. Ball, Robert L. Bowles, Elizabeth L. Coward, and James E. Dodd¹

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1. U.S. Geological Survey, Woods Hole, Mass.

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From 9 to 17 September 1979, the U. S. Geological Survey (USGS) in conjunction with Rosenstiel School of Marine and Atmospheric Sciences of the University of Miami, Florida, and the Woods Hole Oceanographic Institution collected 550 km of multichannel seismic-reflection data south and east of Cay Sal, Bahamas (Figure 1).

Navigation was provided by the USGS's Integrated Navigation/Gravity System built around a Western Geophysical Survey and Data Management System. The Western system uses a Hewlett-Packard 21MX minicomputer and Western designed interface circuitry to record data from six navigation sensors to calculate the accurate position of the vessel. The sensors used were: 1) Velocity output--range-range loran, bottom lock (pulsed) sonar, doppler (continuous) sonar, gyroscope and 2) Position output--Navy Navigation Satellite receiver, hyperbolic loran.

The multichannel seismic-reflection system consisted of 1200-m streamer and Bolt 40-in³ and 500-in³ airguns. The guns were positioned 15 m off the stern and the near phone section was 230 m astern. Shot-point interval was 50 m. The streamer was composed of alternating active and inactive segments, each 50 m long. Twelve-fold data were recorded in SEG-Y format.

The quality of the seismic records is excellent to 5 seconds of recording time with the 500-in³ gun source and to 3 seconds of recording time with two 40-in³ guns as the source. One large anticline, with an apparent width of 10 km and a relief of 1 km, and a tilted, fault-bounded block are the main features revealed in the seismic profiles. Seismic line locations are shown on the attached track chart (Figure 1).

The original records may be seen at the U. S. Geological Survey offices in Woods Hole, Massachusetts. Microfilm copies of the CDP data may be purchased only from the National Geophysical Data Center, NOAA, Code E64, 325 Broadway, Boulder, CO 80303 (303-497-6338).

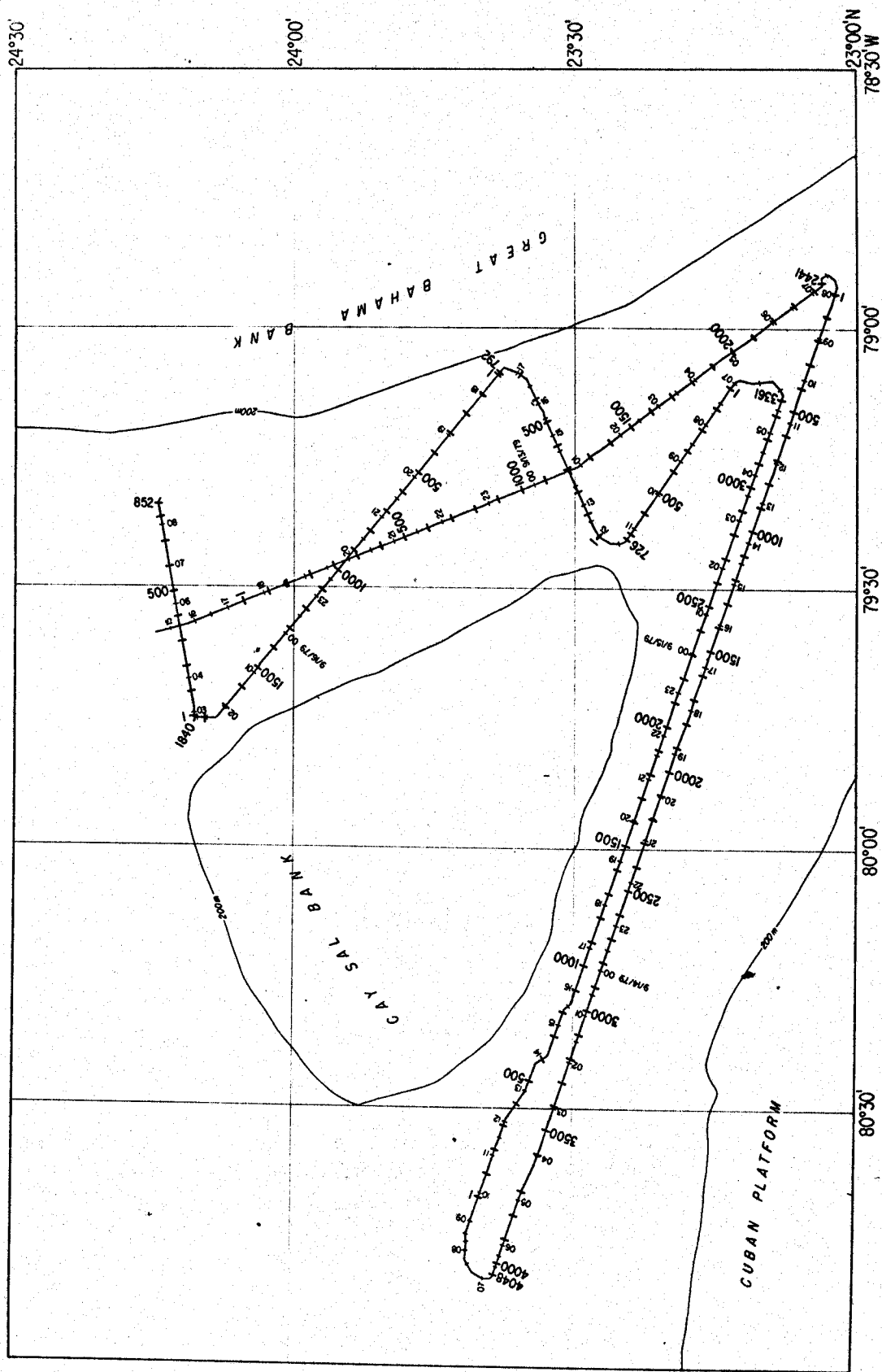


Figure 1.--Seismic-reflection data collection lines. Circled figures are line numbers. Numbers in 500-unit intervals are shot points. Small numbers are times.